

The invention claimed is:

1. In a selective hydrogenation catalyst composition comprising Ni deposited on a porous support wherein the improvement comprises having more than about 60% of said Ni deposited on the outer periphery of said porous support.
2. The catalyst according to claim 1 comprising one or more elements selected from the group consisting of Cu, Pd, Re, Zn, Mg, Mo or Bi.
3. The catalyst according to claim 1 wherein the porous support has a BET surface area of greater than 10 m<sup>2</sup>/g.
4. The catalyst according to claim 1 wherein the porous support has an average pore diameter from about 100 Å to about 450 Å.
5. The catalyst according to claim 1 wherein the porous support has a total nitrogen adsorption pore volume from about 0.4 cc/g to about 1 cc/g.
6. The catalyst according to claim 1 wherein the total nickel content of the catalyst is from about 3 to 20 wt. %
7. The catalyst according to claim 1 wherein the porous support has a BET surface area from about 20 m<sup>2</sup>/g to about 150 m<sup>2</sup>/g, an average pore diameter from about 100 Å to about 450 Å and a total nitrogen adsorption pore volume from about 0.4 cc/g to about 1 cc/g.
8. The catalyst according to claim 7 comprising one or more elements selected from the group consisting of Cu, Pd, Re, Zn, Mg, Mo or Bi.
9. A process of selectively hydrogenating acetylenic compounds comprising contacting said acetylenic compounds with a catalyst according to claim 1 in a reaction zone in the presence of hydrogen under conditions of temperature and pressure to at least partially hydrogenate said acetylenic compounds to the

corresponding compounds having less unsaturation than said acetylenic compounds.

10. The process according to claim 9 wherein acetylenic compounds are present in mixed streams of  $C_2 - C_{12}$  hydrocarbons.

11. The process according to claim 10 wherein a minimum amount of hydrogen present is no less than 50 mole % of the concentration of the total acetylenic compounds present.

12. The process according to claim 10 wherein said catalyst is present in at least two reaction zones.

13. A process of selectively hydrogenating acetylenic compounds comprising contacting said acetylenic compounds with a catalyst according to claim 2 in the presence of hydrogen under conditions of temperature and pressure to at least partially hydrogenate said acetylenic compounds to the corresponding compounds having less unsaturation than said acetylenic compounds.

14. The process according to claim 13 wherein acetylenic compounds are present in mixed streams of  $C_2 - C_{12}$  hydrocarbons.

15. The process according to claim 14 wherein a minimum amount of hydrogen present is no less than 50 mole % of the concentration of the total acetylenic compounds present.

16. The process according to claim 14 wherein said catalyst is present in at least two reaction zones.

17. The method of preparing a selective hydrogenation catalyst composition comprising spraying an atomized nickel compound solution on to a porous support and drying said solution.

18. The process according to claim 17 wherein nickel bearing porous support is dried at temperature in the range from 200 to 800°C.

19. The process according to claim 17 wherein porous support comprises alumina.

20. The process according to claim 17 wherein porous support has BET surface area of greater than 10 m<sup>2</sup>/g.

21. The process according to claim 20 wherein porous support contains one or more elements from Cu, Pd, Re, Zn, Mg, Mo, or Bi.